URBAN EUROPE
Joint Programming Initiative

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Part B – Project description for proposals

Call:	**Joint Programming Initiative Urban Europe**		
Project title:	*Consolidation and Coordination in urban areas*		
Project short title:	*CONCOORD*		
Applicant:	*Name of company or institution*		*Country*
Project partner(s):	*Partner Nr.*	*Name(s) of company and/or institution*	*Country*
	1	Eindhoven University of Technology (**TU/e**)	Netherlands
	2	University of Twente (**UT**)	Netherlands
	3	Technical University Denmark (**DTU**)	Denmark
	4	Middle East Technical University (**METU**)	Turkey
	5	Vienna University of Economics and Business (**WU**)	Austria
	6	Proctor and Gamble (**PG**)	Belgium
	7	DHL (**DHL**)	Germany
	8	EYEFREIGHT (**ITU**)	Netherlands
	9	DINALOG (**DIN**)	Netherlands
	10	HEINEKEN (**HEI**)	Netherlands
	11	BINNENSTADSERVICE (**BIN**)	Netherlands
Thematic content covered:	☐ Topic 1 – Urban diversity and social cohesion ☒ **Topic 2 – Urban systems and networks** ☐ Topic 3 – Governance of complex urban systems		
Project runtime	Estimated start date: **1/1/2013**		Project duration in months (max. 36 months): **36**
Project costs and requested funding	2.283.280		1.365.780

SYNOPSIS:

This proposal focuses on the important area of city logistics. It investigates an integrated urban freight simulation environment, a unique measurement framework for the environmental footprint of transport and logistics, and the performance measurement of new innovative urban transport and logistics concepts. Specifically, we deal with the different and important considerations of new transportation solutions, new mechanisms for execution and control of city logistics, and research on the urban distribution of goods reducing urban freight movements and its impact on residents and the environment. The fundamental idea is to stop considering each shipment, actor (e.g. shippers, Logistics Service Providers, etc.) and vehicle in isolation, but as components of an integrated logistics system to be optimized. The keywords are CONsolidation and COORDination (CONCOORD) of the urban distribution flows that are currently fragmented. The project's results, simulation tools, and insights are, among others, disseminated via an important CONCOORD deliverable: the European Urban Transportation Experience Lab, or the EU/t E-Lab. CONCOORD involves key players in the urban transportation field, both from leading European universities and world-class Europe-based companies, who have expertise and experience in city distribution and who have the willingness to explore this issue for the benefit of all those in Europe.

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1. Quality of work

1.1 Concept and objectives

To enable the common European market to function effectively, an integrated, green and efficient transportation system is required. This will enable the free movement of goods and people within, and into and out of, EU territory. An efficient transportation system is vital for economic growth, European cohesion and the well-being of its citizens. This proposal focuses on the important area of urban related freight transportation flows. Based on the literature and previous European projects, the proposal makes an inventory of smart concepts regarding urban distribution, both in terms of infrastructure, policies and business models, and proposes new ones. Moreover, we develop a systematic evaluation and measurement framework for performance evaluation of these new and innovative transport and logistics concepts. This is the objective of the integrated urban freight simulation system: an indispensable tool that not only serves for validation and verification but in addition offers policy makers and all stakeholders involved an environment to experiment with new models. Specifically, we deal with the different and important considerations of new transportation solutions, new mechanisms for execution and control of city logistics, and research on the urban distribution of goods reducing urban freight movements and its impact on residents and the environment. The fundamental idea is to stop considering each shipment, actor (e.g. shippers, Logistics Service Providers (LSPs), etc.) and vehicle in isolation, but rather see them as components of an integrated logistics system to be optimized. The keywords throughout this project are CONsolidation and COORDination (CONCOORD) of the urban distribution flows that are currently fragmented. The project's results, simulation tools, and insights are, among others, disseminated via an important CONCOORD deliverable: the European Urban Transportation Experience Lab, or the **EU/t E-Lab.** CONCOORD involves key players in the urban transportation field, both from leading European universities and world-class Europe-based companies, who have expertise and experience in city distribution and who have the willingness to explore this issue for the benefit of all those in Europe.

The OECD (Organization for Economic Co-operation and Development) Working Group on Urban Freight Logistics (1) defines urban goods transport as the delivery of goods in urban areas, including the backflow of waste. Freight transportation of goods (both forward flows and reverse flows) is therefore a key activity within urban areas. Many large cities face significant challenges related to the congestion and pollution generated by the number of vehicles which need to travel within urban areas. These vehicles are one of the main causes of undesired environmental side-effects but their role is fundamental to the efficient functioning of Europe as they satisfy many of the transportation needs that occur on a day-to-day basis. Urban transportation includes not only the transportation of goods, but a significant proportion is attributed to the transportation of people. Within the OECD countries, in 1950, 50% of the population lived in cities, 77% in 2000 and it is expected that by 2020, this will rise to 85% (1). Currently, 80% of the European population lives in urban areas, while about 85% of the EU's GDP is generated in cities (2; 3). The demand for urban freight transport is clearly growing, and will continue to do so. In Europe, "*transport is the most problematic emitting sector, with upward emission trends"* (4). Between 1990 and 2007, CO_2 emissions from transport rose by 29% in Europe. Road transport accounts for a sizable portion of CO_2 transport related emissions, nearly 73% in 2000 (5; 6). Within road transport related CO_2 emissions, urban traffic accounts for 40% of CO_2 emissions, and 70% of emissions of other air pollutants (2). In terms of traffic congestion, in Europe, every year nearly 100 billion Euros, or 1% of the EU's GDP, are lost to the European economy as a result of this phenomenon (7).

An important challenge in the transition towards a sustainable urban freight transportation system is the question of how to improve the quality (e.g. carbon footprint and air quality) and quantity (e.g. freight transport movements) of the distribution activities by a better orchestration of the various physical flows. Especially in urban areas, there is a huge potential for the consolidation and coordination of distribution flows that are currently fragmented. Although there are some initial signs of co-operation between shippers, LSPs, municipalities and retailers (e.g. "Amsterdam elektrisch" (8)), there are no examples of commercially successful, environmentally sustainable collaborative solutions in urban areas. Research into feasible collaborative supply chain designs, the associated business models and the critical questions of risk and revenue management, specifically in an urban context, is also limited. City logistics practices seem to be dominated by failing (and often subsidized) initiatives and typically concern very local approaches (9). Rather paradoxically, with the aim of reducing urban freight's nuisance, local authorities sometimes take isolated measures that make efficient city distribution more difficult, resulting in problems and irritation for carriers as well as an increase in emissions. Local regulations, such as time windows, are often not harmonized between cities, resulting in vehicle utilization problems, inefficient transport operations, increased emissions and significant additional costs for carriers and shippers (10).

The focus of this research project is the consolidation of distribution, and the coordination between all stakeholders involved in urban distribution, such as shippers, LSP's, retailers, inspection bodies, and governmental authorities. The key question is how to enable the management of physical good flows such that we achieve higher load factors by maximizing the space usage within each transportation unit and efficient and green routes by minimizing the demand weighted travel times. If we can achieve fewer physical vehicles operating and spending less time within the urban environment it will result in fewer negative impacts (e.g. less congestion, less noise, fewer emissions, etc.). Our belief is that a systematic approach towards improved consolidation and coordination generates innovative distribution concepts based on sound and sustainable business models, while meeting the objectives and restrictions set by municipalities. The proposal also aims to determine what business models are most relevant in the scope of the urban freight transport. Examples include: time window restrictions, designated freight roads, no access for too heavy trucks, investment in parcel delivery infrastructure, multi-modal transport integration etc. The proposed measurement and evaluation framework (i.e. the simulation platform) offers a perfect environment to investigate the consequences of proposed policies, as a basis for sound decision making.

The ultimate goal of CONCOORD is the development of unique and innovative integrated sustainable urban freight transportation tools, embedded in the EU/t E-Lab, in order to:

1. Analyze and benchmark, from different actor perspectives, the performance and the behavior of an urban freight distribution system. Our focus is not only on developing possible policy scenarios for local government. Rather, we will consider the opportunities and challenges faced by industry, given the conditions and policies of local government. Clearly, this approach, as a feedback loop, also provides the tools and strategic, tactical and operational concepts for local governments to evaluate their policy making processes.
2. Through experiments and models, provide support and evidence to enable the strategic, tactical and operational decisions to be applied to urban freight shipments. The challenge is to develop new and improved organizational concepts for advanced logistics, supply chain management and freight management targeted at the urban environment (e.g. night deliveries through electric vehicles, aligning retailers' service requirements, combining deliveries from different sources to different destinations, etc.).
3. Realistically demonstrate the value of the proposed solutions using a large-scale simulation environment based on real-life case studies in collaboration with our industrial partners. Through this simulation, the added value of the proposed solutions for urban freight transport is demonstrated on the basis of both actual practices (coming from our industrial partners) and measurable indicators.

This project directly ties to the *Joint Programming Initiative Urban Europe*.

The **project's objectives** are as follows:

1. We carry out extensive measurement of the problems, the bottlenecks and the performance of the current urban freight transport system. At present, no clear/complete statistics exist for urban areas in Europe. This objective builds on previous EU funded research efforts such as BESTUFS1. Their results demonstrated that there is still a need for further research activity in data collection, with the specific purpose of establishing suitable performance measures and benchmarking.

2. We develop an understanding of the urban retailers and their relevant operations, which give rise to the current levels of urban freight movements. Within urban areas, a major source of transport demand arises from the large number of retailers. There are many examples of inefficiencies within the current system. For example, the same or different, carriers visit the same street multiple times per week, but each time visiting different retailers to deliver small orders. Many goods are delivered following a very frequent service pattern while this requirement, in many cases, does not exist. Analyzing and understanding retailers enables us to examine the opportunities and incentives that will enable companies to modify their current behavior. Examples include nighttime deliveries, sharing delivery times with competitors, etc. There is a trade-off between logistical requirements versus environmental costs.
3. We investigate a number of innovative and validated strategic, tactical and operational concepts and planning tools for urban freight transportation. Specifically, the interplay between the urban infrastructure and the different agents (shippers, retailers and LSPs) will be examined. Different strategic network design alternatives for the urban infrastructure will be compared. Both currently available infrastructures and newly proposed infrastructures will be considered. The important critical, tactical, operational and real-time challenges in urban areas, given these two types of infrastructure, will be evaluated and benchmarked.
4. Aligning the needs and operations of the different autonomous agents, such as carriers, shippers, logistic service providers, retail stores, citizens, and local authorities is a challenging objective, but a prerequisite for the success of the project. Efficient collaboration between the different agents is required for this project to be successful. The agents need to cooperate, horizontally as well as vertically, because the solution concepts rely on the companies sharing resources such as roads and trucks and by consolidating freight. We will seek implementable solutions that are not only efficient in terms of resource utilization but also in terms of acceptability and durability.
5. Complex logistics systems are emerging for large cities, motivating the need for the development of a sustainable integrated urban area simulation tool. This will enable us to reproduce and evaluate different tools and concepts formulated at a higher level of abstraction, yielding the relevant information needed to compute performance measures for the city logistics system and evaluating its impact on the city transportation and its inhabitants.
6. Local and regional governments impose strict rules on freight vehicle access to cities in order to address environmental and social concerns. However, many of the measures significantly increase transportation costs and increase the complexity of the urban freight transportation planning and the emission of global and local pollutants. The tools and concepts generated will help governments improve their policy making and immediately evaluate the policies through the use of a simulation environment. In this way, governmental policies help (rather than counteract) to improve accessibility of cities, reduce congestion, and reduce pollution caused by urban goods distribution.
7. Finally, we note that the Commission has stressed the need to improve levels of accessibility and mobility for citizens and freight in urban areas especially given the clear deteriorations in congestion, safety and air quality in major cities. In its mid-term review of the Common Transport Policy White Paper, the Commissions highlighted the need for improved logistics and co-modality (the use of different transportation modes in combination) in the overall transport systems. Logistics/co-modal transport coordination is a specific capability with the potential to enable and facilitate the solutions required to improve the quality of the European transport system that can be measured by levels of performance, congestion, and pollution.

In the light of the above-described discussions, CONCOORD makes the following ***contributions:***

1. Many urban transportation projects stop after the subsidizing phase, mainly due to a lack of capitalizing the efforts in the private sector. This proposal focuses on the different private sector agents co-operating within the urban environment. This proposal explicitly takes into account the operations and logistical activities of the retail, LSP's and shipper agents, along with the municipalities.

2. This project takes a more integrated supply chain point of view to urban freight transportation. We advocate the coordination and consolidation over all private actors, as well as the consideration of each actor individually. This differs from the traditional approaches of decentralized decision making by the distinct actors. Moreover, we consider all together inbound flows, outbound flows (e.g. waste, packaging, etc.) and the possible transshipment flows within the urban areas (e.g. between retail stores).

3. As a more efficient urban freight transport system will positively impact external societal costs, the project is likely to induce policy makers to take a more collaborative position with the private sector actors. As such, it amplifies the desired effects previously addressed.

4. The outcomes and project results will be consolidated in the EU/t E-Lab. (A real-life feel and touch experience lab within the Dinalog Logistics Experience Lab). Within the EU/t E-Lab, all involved actors are able to see and evaluate how different decisions affect the important performance measures within European Urban Transportation.

The above listed objectives are translated into a number of work packages.

Work package 1 deals with the management of the research project. In **Work package 2**, an in-depth investigation with respect to the strategic use of the urban infrastructure is researched. The focus of this package is investigating the strategic decisions for multiple private sector actors subject to various policy restrictions. Both public and private infrastructures are considered for consolidation and coordination purposes. Specifically, we analyse the potential private sector infrastructure changes like setting up Urban Distribution Centers (UDC). Additionally, the potential changes to specific public sector infrastructure are analysed, for example, equipment required to support intermodal networks for the use of multiple transportation modes. **Work package 3** focuses on the tactical decisions with regards to the urban infrastructure. An interesting example is using electric vehicles as a viable solution for operating urban freight transport by ensuring low noise level and no local environmental impact. Finally, **Work package 4** considers the operational and real-time considerations in the urban context. Also a prototype for a real-time vehicle routing planning (VRP) software which is able to integrate real-time information of current traffic flows on specific road segments in to the produced route plans will be developed.

The implementation of such changes is elaborated in **Work package 5**. In all proposed solution concepts, the challenge of harmonizing the operations of the different actors is needed. The actors need to cooperate, horizontally as well as vertically, because the solution concepts rely on the companies sharing resources such as roads and trucks with consolidated freight. We seek for solutions not only efficient in terms of resource utilization but also in terms of acceptability and durability. For this, it is important that each player benefits from the proposed solution and maintains its autonomy. Moreover, there should be a fair division of gains and benefits among the players.

Work package 6 deals with a real-life simulation environment taking all the relevant elements from the previous work packages. Benchmarking and impact comparison are important steps in this process. In addition, the development of a European solution to urban freight transport needs to incorporate promising and proven solutions, a vision on the comparability and specificity of cities. The simulation should run both pre and post analyses on the distribution of the traffic to be able to test the potential benefits. Finally, **Work package 7** is about the dissemination and valorisation to government, academia, companies of the work performed.

1.2 Progress beyond the state-of-the-art

The importance of city logistic in general and urban freight transport in particular has been receiving increasing attention throughout the years. During the seventies a number of traffic regulations were enacted to reduce or avoid the presence of heavy vehicles in cities (11). Increasing traffic-related problems led to a number of research projects in the nineties (11). Thus, a number of private and public sector initiatives has been proposed (an overview and classification of these projects is presented in (12)). However, a limited amount of scientific research focused on the issue of better transportation management. Most models proposed for urban transportation planning focused on passenger's movements with little, if any, considerations for freight transportation. Even now, very few formal City Logistics models have been proposed in the literature (13; 14; 15). Most of these models mainly focused on passenger transport within urban areas. Modeling the demand of goods is important for urban transport. A number of demand models have been proposed for evaluating the demand for freight movements within urban areas (see (16) for a recent review). The decisions with respect to planning of CDCs in terms of number, location and characteristics have not been extensively studied. In this context, we mention the work of (10).

The city logistics projects initially undertaken in Europe and Japan were based on the single-tiered concept, mostly involving a single UDC and a limited number of shippers and carriers. Different business models and strategies were tested (e.g. (17; 18)). A solution methodology for single-tiered systems is proposed (19). More advanced systems are emerging that handle the complexities of large cities. The majority of such systems have a two-tiered structure. Loads are first consolidated at a CDC into large vehicles, which bring them to a smaller CDC-like facility "close" to the city center. This makes up the first tier of the system. Loads are then transferred to smaller vehicles, appropriate for city center activities, which then deliver to the citizens, thus making up the second tier of the system. The work of (19), proposes a solution methodology for the daily planning for two-tiered systems.

The project builds on this relatively narrow body of literature. Moreover, in order to ensure the success of the project, two of the leading authors frequently cited above (namely, Crainic and Taniguchi) are participating in the project consortium and are member of the advisory board of the proposed project. This project builds directly on the different projects available in the public domain. Below we list a representative selection of the relevant projects. People in this project have contacts with groups in the projects or (have) participate(d) in the mentioned projects.

GS1: GS1 is a non-profit organization dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. It has established the GS1 Logistics Forum (LF) where Retailers, Manufacturers, Material Suppliers and Logistic Service Providers are represented. The aim of the LF is to help these actors in achieving greater benefits of interoperability and to improve visibility of the flow of goods through the supply chain.

NTM: The Network for Transport and Environment (NTM) is a Swedish non-profit member-driven organization, aiming at establishing common values to be used for calculating the environmental impact of different transport modes. The common values can be used once desired parameters are not known within the organization.

SMARTFREIGHT: The main aim of SMARTFREIGHT is to specify, implement and evaluate Information and Communication Technology (ICT) solutions that integrate urban traffic management systems with the management of freight and logistics in urban areas. The actual transport operations carried out by the freight distribution vehicles will be controlled and supported by means of wireless communication infrastructure and on-board and on-cargo equipment.

Trendsetter: The Trendsetter project aims to improve mobility, air quality and quality of life while reducing noise pollution and traffic congestion by promoting innovative projects. Trendsetter's overall strategy is to combine advanced mobility management schemes with clean vehicle fleets, which can achieve both short-term energy and emission reductions and long-term optimization of the public transport and effective urban goods flows. Trendsetter is a large demonstration project focusing both on heavy vehicles and private cars.

SuperGreen: The purpose of SuperGreen is to promote the development of European freight logistics in an environmentally friendly manner. The objectives of the SuperGreen project concern supporting the development of sustainable transport networks by fulfilling requirements covering environmental, technical, economic, social and spatial planning aspects.

DHL: Heathrow airport contracted DHL to manage its consolidation center. The facility is based at a 2 km distance from the airport, where retailers deliver inbound goods. DHL cross-docks goods, manages a booking system and security screening process and delivers to both landside and airside stores. By consolidating 700 inbound deliveries a week into 300 outbound runs, the center achieves significant environmental and operational benefits. In 2008, a total of 218,000 km were saved through the consolidated deliveries of the DHL fleet, which amounted to 158,000 kg less CO_2 emissions and a significant reduction in congestion.

Walmart: Walmart defined concrete and measurable fleet efficiency goals for the U.S. to be achieved by 2008 (25% efficiency increase) and 2015 (100%), respectively. To achieve these goals, Walmart focuses on sustainable logistics solutions and innovative technologies. By increasing the load per truck, the total number of vehicles needed could be reduced and the number of empty truck miles decreased. During 2008–2009, Walmart decreased its miles per driver by over 7% while delivering almost 1.5% more cases. This decrease in miles driven combined with improved truck technologies helped Walmart avoid emitting over 180,000 metric tons of CO_2 emissions in 2009 and save $170 million.

1.3 Methodology and associated work plan

1.3.1 Overall strategy of the work plan

As discussed above, the ultimate goal of this research project is the development of unique, and innovative, integrated sustainable urban freight transportation tools, to be integrated and disseminated via the EU/t E-Lab. First, these tools will facilitate analysis and benchmarking of the current and new behavior of urban freight distribution systems, supply experiments, support and evidence to the effects of strategic, tactical and operational decisions applied to urban freight shipments and realistically demonstrate the value of the proposed solutions using a large-scale simulation environment based on real-life case studies coming from municipalities and the industrial partners. Secondly, we identified that *many city logistics initiatives failed after the subsidizing phase due to several reasons: the business case was negative without subsidy, weak embedding of the solutions in the stakeholders' organizations, no clear view on collaboration among stakeholders, etc.* Finally, from a scientific point of view, many gaps and open problems remained, which need to be cleared out before any successful implementations for urban freight transportation are expected.

The overall strategy of the work plan builds on these three listed important observations and needs. We have defined a work package on the development of integrated sustainable urban freight transportation simulation tools. On top of this, three work packages deal with the specific research questions on the performance measurement strategic, tactical and operational/real-time level. Additionally, we set up a work package dealing with the challenge of harmonizing the operations of the different stakeholders. Figure 1 gives an overview of the different workpackages in the CONCOORD project.

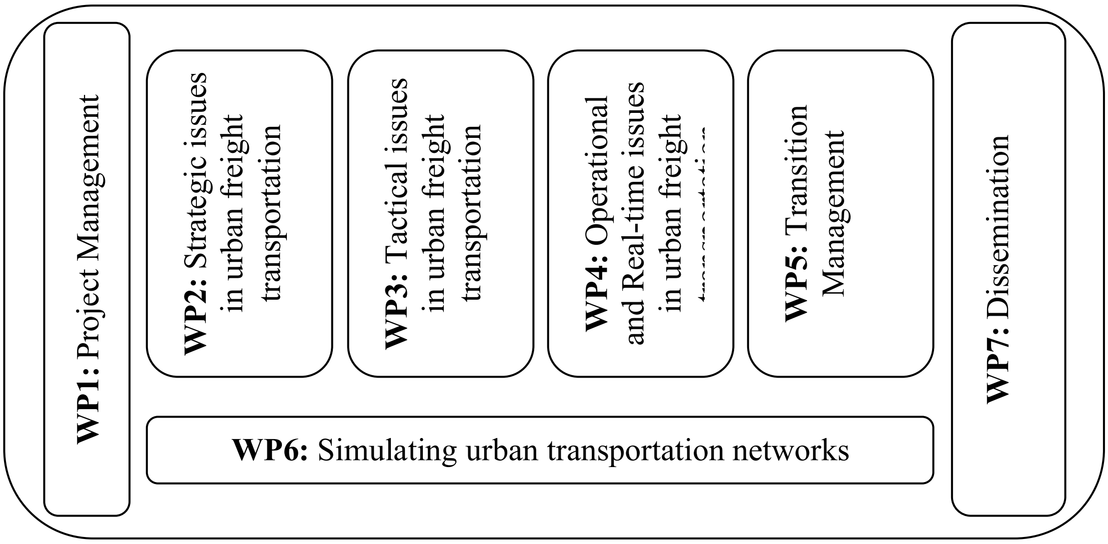


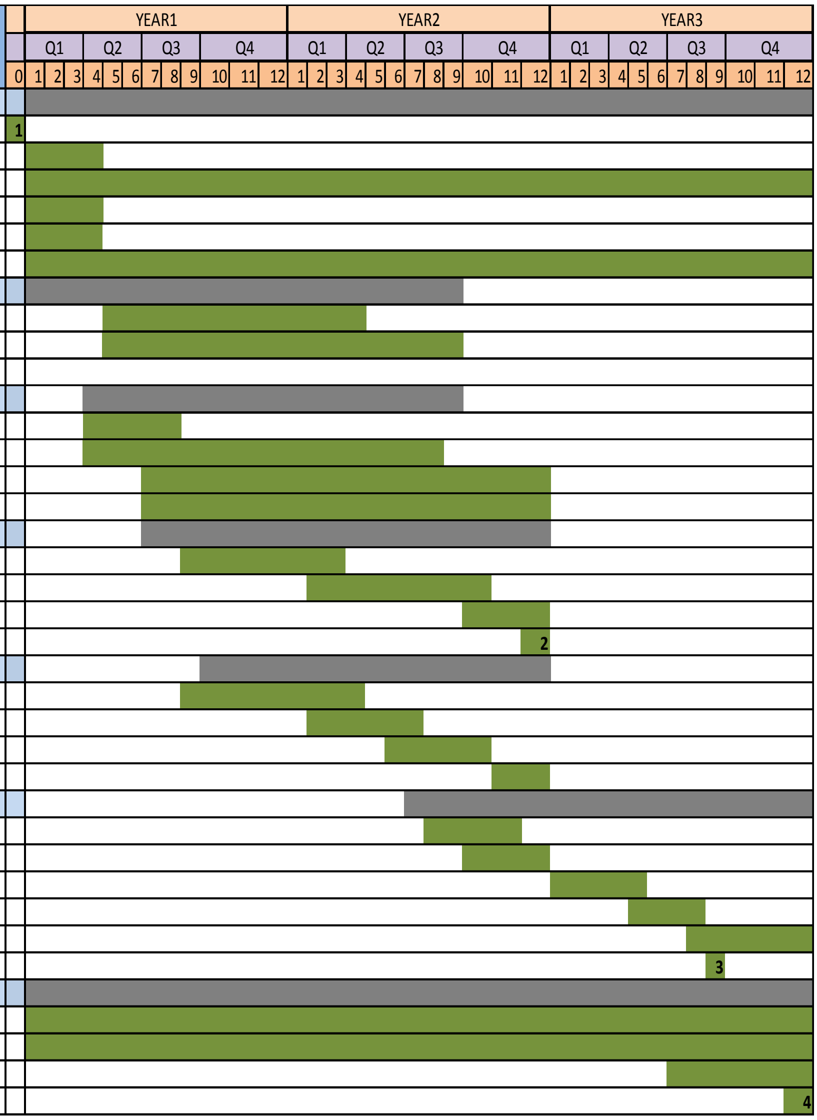
Figure 1: Overview of the different workpackages in the CONCOORD project

The work package leaders of WP1-WP5 are coming from universities, as these are research-oriented workpackages. Work package 6 focuses on the simulation environment and is lead by ITUDE-EYEFREIGHT, our IT partner in the consortium. Finally, Work package 7 is lead by DINALOG, the Dutch Institute for Advanced Logistics. The partnership with DINALOG ensures the wide dissemination of all results to academia, industry and municipalities through their partnering logistical hubs in Europe, i.e. MIT-Zaragoza Logistics Center (Spain), HOLM (Germany) and NGIL (Sweden).

1.3.2 Timing of the different WPs and their components (Gantt chart or similar)

A detailed breakdown of project activities and the timing of each activity are provided in the Gantt chart below containing the duration of the tasks in each Work Package covering the full duration of the project as well as the milestones. Each work package has a verifiable end point being deliverables and milestones that can be controlled and reviewed in Executive Project Management Board meetings. Review meetings are synchronized with ends of project reporting periods as far as deemed useful and feasible.

WP no/Task no	Description
WP1	Project Management
MS 1	Consortium management
1.1	Administrative management
1.2	Financial management
1.3	Quality assurance
1.4	Risk management
1.5	Project repository and reporting system
WP2	Strategic issues in urban freight transportation
2.1	Freight distrubition network design
2.2	Robust freight distribution network design
2.3	Multimodal/intermodal
WP3	Tactical issues in urban freight transportation
3.1	Investigate alternative consolidation schemes
3.2	Routing and consolidating freight movements by products
3.3	Collobarative logistics
3.4	Coordination between different retailers
WP4	Operational and real time issues in urban freight transportation
4.1	Develop a BM for the operational activities
4.2	Integrate real-time data into the BM
4.3	Integrate ITS to embed real-time data into the BM
MS2	Models capturing strategic, tactical and operational decisions
WP5	Transition Management
5.1	Identify the organizational transformations
5.2	Organize a distrubuted control structure
5.3	Organize information sharing
5.4	Organize incentives and gain sharing
WP6	Simulating urban transportation networks
6.1	Describe the urban network
6.2	Market analysis
6.3	Embed all model derived in WPs 2, 3 and 4 into a simulation package
6.4	Design realistic scenarios for testing
6.5	Run and analyse the scenarios
MS 3	Scenarios and simulation results
WP7	Dissemination
7.1	Active dissemination activities
7.2	Passive dissemination activities
7.3	Setting up the Urban Transportation Experience Lab
MS 4	Final results and insights



1.3.3 Detailed work description

The project duration is three years. A detailed breakdown of project activities and the timing of each activity are provided in the Gantt chart below containing the duration of the tasks in each Work Package covering the full duration of the project as well as the milestones.

Table 1.3a: Work package list

Work package No	Work package title	Type of activity	Lead participant No	Lead participant short name	Person-months	Start month	End month
WP1	Project management	MGT	1	TU/e	12	1	36
WP2	Strategic issues in urban freight transportation	RTD	4	METU	44	1	21
WP3	Tactical issues in urban freight transportation	RTD	1	TU/e	40	4	21
WP4	Operational and real-time issues in urban freight transportation	RTD	3	WU	49	7	24
WP5	Implementation policies	RTD	2	UT	26	10	24
WP6	Simulating urban transportation networks	DEM	8	ITU	79	19	36
WP7	Dissemination	Other	9	DIN	37	1	36
		TOTAL			287	1	36

Table 1.3b: List of Deliverables

Del. no.	Deliverable name	WP no.	Nature	Dissemination level	Delivery date
D1.1	Consortium agreement	WP1	R	CO	(M0)
D1.2	Project handbook/guidelines for reporting and presentations	WP1	R	CO	(M4)
D1.3	Quality assurance plan	WP1	R	CO	(M4)
D1.4	Risk management plan	WP1	R	CO	(M4)
D1.5	Progress reports	WP1	R	CO	(M12, M24, M36)
D1.6	Cost statements	WP1	R	CO	(M12, M24, M36)
D1.7	Final report	WP1	R	PU	(M36)
D2.1	Network model including the CDC, smart satellite	WP2	R	PE	(M13)
D2.2	Multimodal/intermodal model	WP2	R	PE	(M17)
D2.3	Report on Scenario analysis. Highlighting the implications on network design issues under probable scenarios	WP2	R	PE	(M21)
D3.1	Developing models for different consolidation schemes	WP3	R	PE	(M9)
D3.2	Studying collaboration between LPS	WP3	R	PE	(M16)
D3.3	Studying coordination between different retailers	WP3	R	PE	(M19)
D4.1	A definition of optimization models and techniques to tackle operational decisions (e.g. routing and scheduling of the vehicles).	WP4	R	PE	(M14)
D4.2	Creation of a framework for the implementation of the optimization techniques developed in D4.1.	WP4	R	PE	(M20)
D4.3	A prototype real-time vehicle routing software based on the consolidation concept which is able to take last-minute requests as well as real-world loading requirements into account	WP4	R	PE	(M24)
D4.4	A prototype ATMS based real-time vehicle routing software	WP4	R	PE	(M24)
D4.5	An evaluation of the potentials of a large-scale ATMS based real-time vehicle routing software	WP4	R	PE	(M24)
D5.1	Design of a MAS for urban transportation; a platform in which agents can be modeled, designed, programmed and be applied	WP5	R	PE	(M16)
D5.2	Pricing mechanisms; what is the price of	WP5	R	PE	(M16)

	using a CDC or roads in an urban area, depending on, e.g., time of day, size of vehicle, and distance travelled				
D5.3	Establishing procedures/rules for achieving coordination between public and private organizations	WP5	R	PE	(M18)
D5.4	Insight in willingness of companies regarding the proposed methods and the way they can be implemented	WP5	R	PE	(M24)
D5.5	A step-by-step approach for the transition towards the use of the proposed solution concepts in practice				(M24)
D5.6	Guidelines to remove barriers for the transition towards more cooperation	WP5	R	PE	(M24)
D6.1	Introduction and description to the different parties involved in the case study	WP6	R	PE	(M23)
D6.2	Description of the case study with an associated descriptive data set, which will be used as a test-bed to validate the result of the project	WP6	R	PE	(M28)
D6.3	A simulation and optimization software	WP6	D	PU	(M31)
D6.4	Scenario analysis results	WP6	D	PU	(M31)
D7.1	Networking report	WP7	D	PE	(M12)
D7.2	Summary of results of consensus building actions	WP7	D	PU	(M36)
D7.3	Material for publication (newsletters, flyers and brochures)	WP7	D	PU	(M30)
D7.4	Project website	WP7	D	PU	(M6)
D7.5	Presentation in conferences and seminars	WP7	D	PU	(M36)
D7.6	Publications in industry magazines and academic journals	WP7	D	PU	(M36)
D7.7	Final project report	WP7	R	PU	(M36)

Table 1.3c: List of Milestones

Milestone number	Milestone name	Work package(s) involved	Expected date	Means of verification
MS1	Consortium agreement	WP1	(M0)	Consortium agreement ready, risk and QA plans available
MS2	Models capturing strategic, tactical and operational decisions	WP2, WP3, WP4	(M24)	Models validated by the Executive Project Management Board
MS3	Scenarios and a simulation results	WP5, WP6	(M33)	Software released and validated by Advisory Group and Executive Project Management Board
MS4	Final results and insights	WP2, WP3, WP4, WP5, WP6	(M36)	Reports are delivered to and validated by the Executive Project Management Board

Table 1.3d: Work description

Work package number	1	**Start date or starting event:**			M1		
Work package title	Project management						
Activity Type	MGT						
Participant number	**1**						
Participant short name	**TU/e**						
Person-months per participant:	**12**						

Objectives

- To coordinate and manage the project and the communication between project partners and with the European Commission.
- To provide Quality assurance of the project results by setting guidelines
- To develop a risk plan to keep the project risks to a minimum.
- To set-up and manage a repository for project documents for online collaboration.
- To provide overall administrative and technical management of the project.

Description of work

Task 1.1: Administrative management [TU/e]

TU/e is responsible for the project management and assigns a project coordinator for the day-to-day management of the project. The project coordinator is supported by the work package leaders and the Executive Project Management Board (EPMB) consisting of a delegate of each partner.

A Consortium Agreement will be signed before the beginning of the project where among others intellectual property rights, exploitation rights, confidentiality, decision and change procedures are described.

TU/e is responsible for the reporting towards the European Commission of project progress and financial performance, and maintaining control over project schedule and budget.

Task 1.2: Financial management [TU/e]

TU/e is responsible for the financial management and assigns a financial collaborator.

Task 1.3: Quality assurance [TU/e]

Implementation of procedures for quality management and performance of quality checks for reports and software tools. Establishment of QA procedures for reports and technical components and definition of QA performance measures for reporting, specification and design of software components and interfaces, technical components, installation and demonstration scenarios

Task 1.4: Risk management [TU/e]

In the first phase of the project the project coordinator and the WP leaders will make a risk analysis to detect unforeseen problems that may hamper the progress of the project, specify main internal and external risks (organizational, technical, legal) and their probability for a successful completion of the project, Fall-back scenarios will be considered to achieve the project objectives with a definition of measures to minimize those risks, definition of fallback scenarios. Inputs are required from the other WPs.

Task 1.5: Project repository and reporting system [TU/e]

The coordinator will use the management tool EU-XPERT to manage, delegate, collate and report the project progress.

Role of Participants
TU/e: WP leader

Deliverables
D1.1 Consortium agreement (M0)
D1.2 Project handbook/guidelines for reporting and presentations (M4)
D1.3 Quality assurance plan (M4)
D1.4 Risk management plan (M4)
D1.5 Progress reports (M12, M24, M36)
D1.6 Cost statements (M12, M24, M36)
D1.7 Final report (M36)

Work package number	2	**Start date or starting event:**		M1			
Work package title	Strategic issues in urban freight transportation						
Activity Type	RTD						
Participant number	**4**	1	5				
Participant short name	**METU**	TU/e	WU				
Person-months per participant:	**24**	10	10				

Objectives

- Provide models to generate freight distribution network designs for different scenarios.
- Integrate location and handling capacity decisions for distribution network.
- Provide models for robust freight distribution network design against disruptions.
- Evaluate single-tier and two-tier network models for alternative scenarios.
- Consider complexities that arise from existence of different modes of transport in the system.

Description of work

Task 2.1: Freight distribution network design [METU, TU/e, WU]
One of the most critical decisions in designing a freight movement system for urban area is to locate City Distribution Centers (CDCs) and satellites. CDC and satellite location decisions affect the traffic congestion in the city. At strategic level, another crucial aspect to consider is the handling capacities of distribution centers and satellites.

We will develop models which integrate location and distribution capacity assignment (storage and handling capacities of distribution centers (DCs), fleet mix and size) decisions considering potential levels of freight movement in the area. The models will also estimate and control the traffic and environmental effects of location decisions.

Alternative designs will be generated for single-tier and two-tier models. Efficiency of models will be evaluated under different scenarios.

Task 2.2: Robust freight distribution network design [METU, TU/e, WU]
A freight distribution network may be disrupted by unexpected events like disasters, severe weather conditions, accidents, etc. To keep the freight movement service running, possible disruption scenarios and possible reactions to those disruptions (like using alternative routes for incoming and outgoing flows) should be considered. We will develop models which find robust and resilient networks against disruptions.

Task 2.3: Multimodal/intermodal [METU, TU/e, WU]
Freight movements may involve different modes of transport. For example, if a significant part of incoming flow to a city is delivered by sea transportation, then the distribution network design decisions have to be made accordingly.

Role of Participants:
METU: WP leader

Deliverables D2.1 Network model including the CDC, smart satellite (M13) D2.2 Multimodal/intermodal model (M17) D2.3 Report on Scenario analysis. Highlighting the implications on network design issues under probable scenarios (M21)

Work package number	3	**Start date or starting event:**		M4		
Work package title	Tactical issues in urban freight transportation					
Activity Type	RTD					
Participant number	**1**	4	2	5			
Participant short name	**TU/e**	METU	UT	WU			
Person-months per participant:	**16**	6	6	12			

Objectives

- Study different consolidation schemes for freight distribution system.
- Develop routing models from distribution centers to retailers which consolidate flows by using different schemes.

Description of work

Task 3.1: Investigate alternative consolidation schemes [TU/e, UT, METU, WU]
Outgoing flow from distribution centers can be consolidated by a central decision maker. This helps to improve truck utilization ratios by decreasing the number of empty or almost empty travels in freight distribution system. Decision maker may choose to consolidate flows by supply chains (suppliers), by products, by geographic area, or by time. Investigate alternative consolidation schemes by studying organizational and operational requirements for each. Highlight advantages and disadvantages of different schemes.

Task 3.2: Routing and consolidating freight movements by products [TU/e, UT, METU, WU]
Different product types can be transported using vehicles with different specifications such as installed equipment on vehicle, vehicle size, etc. One way of consolidating freight flow is to cluster the products by their types. For example, goods that require refrigerated vehicles can be consolidated. A group of products could be supplied by a large number of suppliers and demanded by a large group. The problem is to design a mechanism which would encourage a large group of suppliers and retailers to join the consolidation scheme.

Task 3.3: Collaborative logistics [TU/e, UT, METU, WU]
By modeling the potential alliances between *Logistic Service Providers* (LSPs), different alliance structures are to be studied. The model will determine the allocations between transportation requests and residual logistics capacities. Moreover it will determine the allocation of profit between collaborators.

Task 3.4: Coordination between different retailers [TU/e, UT, METU, WU]

Retailers are often located relatively close to each other, e.g. in the same shopping street. In almost all cases, retailers act independently of one another. Specifically, it would be interesting from a transport consolidation point of view, to coordinate the inventory ordering process among different retailers. Delivery schedules need to be adapted among different retailers employing different inventory policies.

Role of Participants:
TU/e: WP leader

Deliverables

D3.1 Developing models for different consolidation schemes (M9)
D3.2 Studying collaboration between LPS (M16)
D3.3 Studying coordination between different retailers (M19)

Work package number	4	**Start date or starting event:**		M7		
Work package title	Operational and real time issues in urban freight transportation					
Activity Type	RTD					
Participant number	**5**	2	3				
Participant short name	**WU**	UT	DTU				
Person-months per participant:	**20**	14	15				

Objectives

- Developing routing and scheduling mechanisms fitting the urban environment.
- Developing a tool for determining the assignment of carriers to transport operations.
- Incorporating real-time vehicle routing in an urban context.

Description of work

Task 4.1: Develop a business model (BM) for the operational activities [WU, DTU, UT]

A tool is needed which helps in deciding the assignment of transportation operations to the best subset of carriers. The output of WP4 will be a consolidation scheme defining a set of rules used to establish distribution plan, given an incoming and an outgoing flow of goods. These plans can be seen as static plans as they are constructed on known information given as input in the planning phase.

Task 4:2 Integrate real-time data into the BM [WU, DTU, UT]

Last-minute requests of service often occur and have to be handled in real-time. This requires changing the previously created static plans. In particular, new consolidation rules have to be established which help in managing real-time requests by inserting them in the previously constructed schemes. At the operational level, we will investigate innovative methodologies for intra-city vehicle routing and scheduling.

a) Investigate how we can increase vehicle utilization by utilizing empty space (e.g. on backhauls) in vehicles
b) Explore how we can more effectively utilize the space within vehicles by investigating the real-world two-dimensional and three-dimensional loading.
c) Complex discrete event simulation models to evaluate different approaches such as scheduling rules for consolidation and Vendor Managed Inventory concepts.

Task 4.3: Integrate suitable ITS to facilitate the integration of real-time data into the BM [WU, DTU, UT]

In this task of this work package, we will investigate the integration of innovative ITS, focusing on the real time aspects of vehicle routing. This can be seen as a case of dynamic traffic management in which use is made of real-time data of traffic flows on each link/arc in the network to guide the vehicles to select the system optimal route instead of letting the individual drivers decide the routing. Specifically, we will:

a) Design, specify and model an ATMS based real-time vehicle routing planning software
b) Develop in this WP (subproject) a prototype of an ATMS based for a real-time vehicle routing VRP planning software.
c) Test, analyze and evaluate the developed prototype using the advanced simulation model implemented in WP6.

Role of Participants:

WU: WP leader

Deliverables

D4.1 A definition of optimization models and techniques to tackle operational decisions (e.g. routing and scheduling of the vehicles) (M14)

D4.2 Creation of a framework for the implementation of the optimization techniques developed in D4.1 (M20)

D4.3 A prototype real-time vehicle routing software based on the consolidation concept which is able to take last-minute requests as well as real-world loading requirements into account (M24)

D4.4 A prototype ATMS based real-time vehicle routing software (M24)

D4.5 An evaluation of the potentials of a large-scale ATMS based real-time vehicle routing software (M24)

Work package number	5	Start date or starting event:	M10			
Work package title	Transition Management					
Activity Type	Research and technological development					
Participant number	**2**	1	3	4		
Participant short name	**UT**	TU/e	DTU	METU		
Person-months per participant:	**12**	6	2	6		

Objectives

The main goal of this work package is to increase the acceptability and durability of the proposed solution concepts from work packages 2, 3 and 4. In all proposed solution concepts, we face the challenge of aligning the needs and operations of autonomous players, such as shippers, LSP's, retail stores, citizens, and local government. These players need to cooperate, horizontally as well as vertically, because the solution concepts rely on the companies sharing resources such as roads and trucks with consolidated freight. However, these players all have their own logistical goals, resources, demand, and information. As a result, we seek for solutions that are not only efficient in terms of resource utilization but also in terms of acceptability and durability.

Description of work

Task 5.1: Identify the organizational transformations needed for successful implementation of the policies [UT, TU/e, METU]

The main challenge is how to organize collaboration within complex urban transport networks such that it will be accepted by the users and leads to a more sustainable solution. These results in great challenges since a whole range of practical issues have to be addressed, such as the reluctance to share information, ineffective use of available information, inefficient use of available capacity, and lack of trust between companies. To overcome these barriers, we have to introduce proper control structures, incentives, and mechanisms to divide the gains and costs. We explain these topics in the subsequent tasks.

Task 5.2: Organize a distributed control structure [UT, TU/e, DTU, METU]

Here we primarily aim to address the difficulties of the proposed solution concepts from an organizational perspective in order to get a transition towards more collaborative logistics. Specifically, we want to investigate which control and governance strategies should be used to increase efficiencies in urban distribution. Among others, a control structure specifies which parties are involved in the decision processes, which information has to be exchanged, and who has to communicate with whom at which moment in time. One approach would be to introduce an independent third party, possible governmentally regulated, and that aligns the use of shared resources. However, decisions cannot be made without the help of the companies. This might cause problems since it is likely that the companies are reluctant to share competitive sensitive information and it might be difficult to force certain decisions. A recent development that seems suitable for these environments is the concept of a multi-agent system (MAS). Here, the different stakeholders are represented by intelligent software agents that autonomously interact with each other in order to come up with efficient and robust plans that are acceptable for all players involved.

Task 5.3: Organize information sharing [UT, TU/e, DTU, METU]

With regard to information sharing, we have to consider (i) what the minimum information exchange level is in order to use the proposed solution concepts, and (ii) what the effect would be of sharing more information. Issues that then arise include which data can be shared, which data can be transferred but not shared, and which data has to be kept private. This heavily influences the amount of information the software agents have to operate on. When extra information is shared or transferred to the agents, this can lead to significant improvements of their effectiveness. We will define several scenarios for data sharing / data hiding and investigate the effects on overall performance, in relation to the agents and the external scenarios used.

Task 5.4: Organize incentives and gain sharing [UT, TU/e, DTU, METU]
Crucial aspects of successful cooperation between private and public parties in complex logistic networks are the division of (dis)advantages and the incentives for parties to join the collaboration. We want to make a distinction between incentives based on free market economics and external incentives based on governmental regulations.
To support the interaction between the different players, and to increase efficient allocation of goods and resources, we consider techniques from the free market economy such as dynamic pricing. This concept has proved to be a good means to assign scarce assets efficiently to groups of opportunistic individuals. Using dynamic pricing, prices might be adjusted based on the expected demand in combination with the available capacity such that demand automatically shifts away from the peak hours without the need of sharing competitive sensitive information. We also consider the use of electronic auctions where intelligent software agents participate to align supply and demand.
Besides incentives from free market economics, we also consider incentives based on governmental regulations such as (i) prohibiting that large vehicles enter urban areas (during certain time windows), (ii) the introduction of taxes for driving in an urban area based on properties such as the size of the vehicles, the travelled distance, the time of the day, and the day of the week, and (iii) the mandatory use of parcel delivery points and CDCs. The option only relying on free market economics versus the option of strict (governmental) regulations are two extremes in a range of possibilities. The option of strict regulation will most likely have the largest positive impact (e.g., decreasing traffic congestion and carbon dioxide emission), but will be hard to implement. However, this option serves as a benchmark for the other options. This research tries to find the most suitable combination of regulations, determent policies (e.g., introducing time-dependent road taxes), and incentives policies.

Role of Participants:
UT: WP leader

Deliverables
D5.1 Design of a MAS for urban transportation; a platform, in which agents can be modeled, designed, programmed and be applied (M16)
D5.2 Pricing mechanisms; what is the price of using a CDC or roads in an urban area, depending on, e.g., time of day, size of vehicle, and distance travelled (M16)
D5.3 Establishing procedures/rules for achieving coordination between public and private organizations (M18)
D5.4 Insight in willingness of companies regarding the proposed methods and the way they can be implemented (M18)
D5.5 A step-by-step approach for the transition towards the use of the proposed solution concepts in practice (M24)
D5.6 Guidelines to remove barriers for the transition towards more cooperation (M24)

Work package number	6	**Start date or starting event:**		M19		
Work package title	Simulating urban transportation networks					
Activity Type	DEM					
Participant number	**8**	**1**	2	3	4	5	6
Participant short name	**ITU**	**TU/e**	UT	DTU	METU	WU	PG
Person-months per participant:	**24**	12	12	7	8	2	2
Participant number	7	9	10	11			
Participant short name	DHL	DIN	HEI	BIN			
Person-months per participant:	2	2	2	6			

Objectives

This work package will provide an integrated simulation and optimization package that serves as a tool to analyse and evaluate the current state of urban networks. Furthermore, it will reflect the impact of strategic, tactical and operational decisions on their performance, given the constraints imposed by policy makers. In addition to the output of the prior work packages, a case study is created involving different cities, carriers and software developers.

Description of work

Task 6.1: Describe the urban network [ITU, TU/e, UT, METU, DTU, WU, PG, DHL, HEI, DIN, BIN]

A representation for freight transportation networks in an urban context is needed. Two levels of representation are required. On the one hand, to evaluate the impact of operational decisions, a very detailed and accurate representation is required including information describing both the physical topology and the managements of the network. On the other hand, evaluating the impact of strategic decisions readily requires an approximation of the original network with an emphasis on its topological structure. Tactical decisions require different levels of complexity depending on the decision in question. Input data of the simulation module includes flows of various types of freight in an urban setting, origins and destinations thereof, the existing infrastructure of network and its characteristics: existing facilities, service capacities, type of deliveries, number and capacity of existing storage facilities, etc.

Task 6.2: Market analysis [ITU, TU/e, UT, METU, DTU, WU, PG, DHL, HEI, DIN, BIN]

Once the network design and the consolidation phases are determined it is necessary to establish who will be in charge to carry out all transportation operations, both to CDCs and satellites, and inside the urban area. Clearly this strongly depends on the consolidations scheme: for example, in the case of a consolidation by supply chains scheme, each supplier will decide on its own who will transport the goods to its citizens. In general, carriers will be needed which are charged of these transportation operations. The choice of the carrier clearly depends on the price required for taking care of the transportation. Many carriers will compete and each carrier can make an offer only on a subset of the transportation activities.

Task 6.3 Embed all model derived in WPs 2, 3 and 4 into a simulation package [ITU, TU/e, UT, METU, DTU, WU, PG, DHL, HEI, DIN, BIN]

In this task, input from work packages 2, 3 and 4 are embedded in a generic and integrated model that focuses on city logistics systems where consolidation and coordination are performed at facilities which are organized into a hierarchical structure, with major terminals sited at the city limits and satellite facilities strategically located close to or within the city center. Particular vehicle fleets are dedicated to each system level, load transshipment being performed at satellites. Such hierarchical, usually two-layered, systems are increasingly proposed for large cities with serious transportation-related problems, but no well-established methodology has yet been proposed to assist the associated planning processes.

Task 6.4 Design realistic scenarios for testing [ITU, TU/e, UT, METU, DTU, WU, PG, DHL, HEI, DIN, BIN]
In this task, realistic scenarios for testing are derived based on intensive discussion with the different parties involved in the case study. The scenarios include, among others, consolidation rules, realistic input parameters (e.g. costs, speeds, etc.) and constraints set by policy makers (possible locations to build a new CDC).

Task 6.5 Run and analyze the scenarios [ITU, TU/e, UT, METU, DTU, WU, PG, DHL, HEI, DIN, BIN]
In this task the scenarios are run, and the impact of the different decisions made at the different levels are analyzed.

Role of Participants:
ITU: WP leader

Deliverables
D6.1 Introduction and description to the different parties involved in the case study (M23)
D6.2 Description of the case study with an associated descriptive data set, which will be used as a test-bed to validate the result of the project (M28)
D6.3 A simulation and optimization software (M31)
D6.4 Scenario analysis results (M31)

Work package number	7	Start date or starting event:	M1			
Work package title	Dissemination					
Activity Type	Other					
Participant number	**9**	1	2	3	4	5	11
Participant short name	**DIN**	TU/e	UT	DTU	METU	WU	BIN
Person-months per participant:	**6**	6	6	1	6	6	6

Objectives

- To disseminate the project results to a broader audience in order to create awareness and buy in
- To support the consensus building between the different actors
- To disseminate the design and feasibility of the urban freight simulation environment, to enable logistic service providers, retailers and shippers to optimize their operations

Description of work

Task 7.1 Active dissemination activities [DIN, UT, TU/e, METU, DTU, WU, BIN]

Active dissemination activities consist of presentations at both industrial and academic conferences and seminars, and publications in industry magazines and academic journals. Next to this workshops and seminars will be organized to showcase the results obtained for the industry actors, municipalities and the broad audience.

Task 7.2 Passive dissemination activities [DIN, UT, TU/e, METU, DTU, WU, BIN]

This task will focus on the passive dissemination channels such as set-up of a website, link from the project partners websites to the website, production of flyers and newsletters which are foreseen at a half-yearly basis.

Task 7.3 Setting up the Urban Transportation Experience Lab [DIN, UT, TU/e, METU, DTU, WU, BIN]

DINALOG will enable the setup of the European Urban Transportation Experience Lab (EU/t E-Lab), to be located in the Open Innovation Campus in Breda (the Netherlands). The Urban Transportation Experience Lab will be part of the broader Logistics Experience Lab located in Breda.

Role of Participants:

DIN: WP leader

Deliverables

D7.1 Networking report (M12)
D7.2 Summary of results of consensus building actions (M36)
D7.3 Material for publication (newsletters, flyers and brochures) (M30)
D7.4 Project website (M6)
D7.5 Presentation in conferences and seminars (M36)
D7.6 Publications in industry magazines and academic journals (M36)
D7.7 Final project report (M36)

Table 1.3e: Summary of staff efforts

Participant short name	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total person months
TU/e	**12**	10	**16**		6	12	6	62
UT			6	14	**12**	12	6	50
DTU				15	2	7	1	25
METU		**24**	6		6	8	6	50
WU		10	12	**20**		2	6	50
PG						2		2
DHL						2		2
ITU						**24**		24
DIN						2	**6**	8
HEI						2		2
BIN						6	6	12
Total	12	44	40	49	26	79	37	**287**

2. Implementation

2.1 Management structure and procedures

The management and decision-making structure are kept as simple as possible with direct communication links between the responsible parties in order to optimize resources for the core activities in the project. The management structure is established to ensure that work is carried out timely and based on strong scientific principles. The proposed management structure ensures the effective administration of the project, careful monitoring of the scientific and technical progress, timely completion of the deliverables, monitoring of the end-user involvement at critical decision points and communication to a wider audience.

Project Coordinator (PC): The PC has overall responsibility for intermediation between the Consortium and the Commission, both during proposal, the contract negotiation and following project stages. He is also responsible for submitting the deliverables. The project coordinator is also the final responsible for the financial and contractual obligations defined in the contract with the Commission.

The project coordinator will delegate the daily operation tasks to the Project Management Team, submits all reports, handles all financial statements and payments, chairs the Executive Project Management Board (EPMB) and maintains all the communication to the Commission. The PC role will be undertaken by TU/e. The specific obligations of the coordinator must be distinguished from the management of the consortium activities. The coordinator's specific obligations are:

- To ensure accession to the contract by the other contractors;
- To ensure the communication between Consortium and Commission;
- To receive and distribute the EC contribution;
- To keep project accounts.

Project Management Team (PMT): The PMT provides the necessary support for day-by-day project management and administration of the project. It reports to the Coordinator, and takes charge of supporting and providing assistance to the Coordinator and the EPMB in their day-to-day tasks. It is led by the Project Manager (PM) and will additionally comprise a Project Administrator and other support staff as necessary to fulfill its responsibilities, which will include production of non-technical reports (management, progress and financial reporting); maintaining consolidated records of costs, resources, and time-scales, ensuring the necessary infrastructure for intra-project communication, and operational liaison with the Commission.

Administrative Secretariat (AS): The Administrative Secretariat will be permanent during the project duration and will be responsible for supporting all managerial activities. It is assigned to the PM/PC.

Executive Project Management Board (EPMB): EPMB is responsible for the overall organization of the project, and for ensuring that the project has an effective and achievable exploitation strategy. The EPMB is composed of the main scientific contact persons of each partner. The Project Chairman will chair the EPMB in collaboration with the Vice Chairman. The EPMB constitutes the decision board of the project. The EPMB will be responsible for the final decisions on general project management issues resulting from:

- Reviewing overall project progress;
- Reviewing the work plan and the consortium structure;
- Ensuring that the project maintains its objectives and relevance;
- Monitoring and maintaining the coherence and integration of the project;
- Deciding on development roadmaps for the Project;
- Resolving technical, administrative or contractual issues;

- Provision of the required directions for the course of the project;
- Final decisions concerning the project implementation;
- Final decisions concerning the rerouting of financial resources, based on the suggestion of the Project Coordinator;
- Solutions concerning disputes among the consortium partners;
- Membership of new partners to the project consortium, by implementing, on Commission consent, competitive calls to find new participants (if any);
- Replacement, on Commission consent, of partners, if any serious difficulties arise throughout the project duration;
- Obtaining and observing the plans for the management of knowledge, the rules for the protection of intellectual property rights and the plan of other innovation-related activities;
- (IPR agreements are part of the consortium agreement);
- Relevant decisions related to convergence and coherence of the actions of the project in consecration of the Technical & Quality Assurance Task Force;
- Obtain the plan concerning gender equality in the project (if needed).

Work package Management Teams: Work package Management Teams will be established for each Work package. Each Team will consist of one representative from each partner performing work under the Work package, and will have a Work package Leader (WPL) designated by the Lead Partner, together with a deputy from the Second Lead, to represent the Team in the EPMB and to coordinate the work of the Work package. The WPL is appointed by each partner responsible for a work package. The WPL is member of the EPMB. The WPL reports to the AL it belongs and the EPMB about the performance, evolution and results of the WP he leads. More specifically, the duties of the WPL are:

- Day-to-day management of the corresponding WP;
- Turning the corresponding WP reports in time;
- Monitoring the progress of the WP against time and budget allocations and ensure that the work package fulfills the objectives listed as milestones and deliverables;
- Organizing implementation of Quality Management and Quality Control within the WP
- Alerting in case of delay or default and reporting to the corresponding CL.

Advisory Board: For the consensus building process between the main focus groups (shippers, logistic service providers, retailers and municipalities) and assuring the wide distribution and dissemination of the project results an Advisory Board has been formed in support to the CONCOORD project. The advisory board is composed of the following members:

1. Sergio Barbarino, Principal Engineer, Process Breakthrough Supply Network Innovation Center, **Procter & Gamble R&D**, Belgium
2. Laurens van de Rotte, Manager Corporate Distribution & Logistics, Group Logistics, **Heineken**, The Netherlands
3. Sander van den Berg, Head of LLP Services Europe/CEE, **DHL**, Germany
4. Wouter Lammerse, Director **ITUDE-EYEFREIGHT**, The Netherlands
5. Ton de Kok, **European Supply Chain Forum**, The Netherlands
6. Jan-Willem Hommes, **City of Eindhoven**, The Netherlands
7. Peter van der Sterre, **European Shipper Council (ESC),** Belgium
8. Ian Wainwright, **Transport for London**, Delivery Planning Team, UK
9. Eiichi Taniguchi, Professor, Department of Urban Management, **Kyoto University**, Kyoto, Japan
10. Teodor Gabriel Crainic, NSERC Industrial Research Chair in Logistics Management, School of Management, UQAM and Director, ITS Laboratory, **CIRRELT,** Montreal, Canada

2.2 Individual applicants

2.2.1 University of Technology Eindhoven (TU/e)

Eindhoven University of Technology (TU/e) is a research-driven, design-oriented university of technology at an international level. TU/e focuses within the ‘engineering science & technology’ domain on the specific areas in which it takes or can take a significant role in the international scientific world, and in which it can make meaningful contributions to the knowledge-intensive industries and other sectors of the community with a high, or rapidly developing, technology intensity. Together with Delft University of Technology and the University of Twente, the TU/e forms the ‘Federation of 3 Universities of Technology’.

Main tasks within the project

TU/e is the Project Coordinator, will lead Work Package 1 and 3 and contributes to the Work Packages 2, 5, 6 and 7 at different levels of involvement.

Profile of staff members

Dr. Tom van Woensel
Tom Van Woensel is Professor of Freight Transportation and Logistics at the Technische Universiteit Eindhoven in the Netherlands. He holds an MSc in Applied Economics and a PhD in Operations Management from the University of Antwerp (Belgium). After the completion of his PhD, he moved to the Eindhoven University of Technology where he started as Assistant Professor (2003-2010) with a specialization in Retail Operations, distribution logistics and the analysis of manufacturing systems. Today, his research is mainly focused on transportation planning under uncertainty and retail operations. He published over 30 papers in academic journals (including Management Science, Production and Operations Management, Computers and Operations Research, Transportation Research, European Journal of Operational Research, Journal of Mathematical Modeling and Analysis, and International Journal of Production Economics) and several chapters in international books. Van Woensel is also a board member of the European Supply Chain Forum, a collaborative effort with about 20 large multinational companies. He also held visiting appointments at the Université Catholique Louvain (Belgium), University of Antwerp (Belgium), Lessius University College (Belgium) and the MIT-Zaragoza Logistics Center (Spain).

Dr. Teodor Crainic
Dr. Crainic is the NSERC Industrial Research Chair on Logistics Management. The chair focuses on the integrated study of freight transportation and logistics systems. The main objective of the Chair is to develop innovative and efficient models, methods and decision-support instruments for the analysis, design, planning, and operational management of transportation and logistics systems. The training of highly-qualified personnel and the technological transfer are also important components of the Chair’s mission. The Chair is built on the vision of a methodological integration of several disciplines and a research program inspired by industrial and institutional needs, which harmoniously balances fundamental and applied research. Dr. Crainic has a visiting professor status at the Eindhoven University of Technology.

Dr. Nico Dellaert
Nico Dellaert is Associate Professor in Operations Planning and Control at the Technische Universiteit Eindhoven, in The Netherlands. He is a member of the Industrial Engineering School, and director of the International Program in Logistics Management Systems at that university. He has also held positions at the Econometric Institute of the Erasmus University in Rotterdam and Ortec Consultants in Gouda. His research field is quite broad, varying from the design of sewer systems, insurance claim behaviour, container terminal planning to production-inventory control and health care operations planning. Currently, his prime research interests are on the integration of capacity and inventory decisions, on vehicle routing with uncertainty and on healthcare planning. In his work he uses a large variety of mathematical modelling techniques. He has been teaching various courses related to inventory control, goods flow control, system dynamics and to the design of operations planning and control systems. He participated in several projects in the Rotterdam harbour, project in hospitals and projects for refinery installations.

Other participants: Dr. Ola Jabali, Said Dabia

2.2.2 University of Twente (UT)

The University of Twente (UT) is a research university concentrating on technological development and its implementation in society. Core activities are in the science and engineering field, with world-renowned institutes areas such as nanotechnology, (bio)medical technology, information and communication technology, environmental engineering. Next to science and engineering, a number of departments are concentrating on implementation of technology, smart logistic and supply chain concepts, public governance, and topics in business management and behavioral sciences related to technology assessment and introduction. The UT is an entrepreneurial university, which generated more than 700 spin-off companies in the last thirty years, a track record unprecedented in the Netherlands and Western-Europe. The UT is part of the Federation of 3 Universities of Technology (with Delft University of Technology and Eindhoven University of Technology).

Main tasks within the project
The department Industrial Engineering and Business Information Systems (IEBIS) will participate in several workpackages (in particular WP3, WP4, WP6). It will lead Workpackage 5 focusing on methodologies to smooth the transition from old to new working practice in City Distribution. One PhD student and a number of MSc students will be involved in WP5 and partly in the other workpackages, next to contributions from staff members dr. ir Schuur, dr. ir. Schutten, dr. ir. Mes and one post-doc researcher (vacancy).

Relevant experience
The department IEBIS is part of the School of Management and Governance within the University of Twente. The department currently employs more than 30 researchers, including PhD students. The group Operational Methods for Production and Logistics (OMPL, a subdepartment of IEBIS) holds a strong record on research in the field of Industrial Engineering and Operations Management, research that is characterized by the use and development of quantitative methods, especially from Operations Research. The group has conducted extensive research in the fields of Supply Chain Inventory Management, Physical Distribution and Vehicle Routing, Materials Handling, Service Logistics and Maintenance. Key projects include the alignment of multi-mode transport devices in container transport, congestion and European legislation based vehicle routing, capacity allocation and spare parts management in service logistics, agent-based technologies for distributed decision making, reverse logistics aiming at reducing environmental damage, capacity planning and logistics in health care institutions, public purchasing, etc.

Profile of staff members
Dr. Henk Zijm
Henk Zijm (1952) is a full professor in Production and Operations Management and chair of the subdeparment of Operational Methods for Production and Logistics in the Faculty of Management and Governance of the University of Twente. Between 1983 and 1990 he worked with Philips Electronics in various positions in manufacturing and supply chain management; in addition he was appointed as full professor at Eindhoven University of Technology in 1987. In 1990 he joined the University of Twente as a full professor in Production Engineering and Management. His research interests include production and supply chain management, warehousing, maintenance planning and control, service logistics and process planning. He has been a consultant to a large number of companies both in the Netherlands and abroad. He has published more than 100 articles in international refereed scientific journals and is the (co-)author of two books. He supervised more than 150 master and more than 20 PhD students and serves as associate editor of two journals in his field. In addition, he held several administrative positions, including positions as Scientific Director of the Centre for Telematics and Information Technology, and Dean of the Faculty of Electrical Engineering, Mathematics and Computer Science. In 2004, he was selected to become the Rector Magnificus (Vice Chancellor) of the University of Twente, a position he fulfilled until January 2009.

Besides holding the chair in Production and Operations Management, he is Scientific Director DINALOG (the Dutch Institute of Advanced Logistics). Professor Zijm is also a past president of ISIR (the International Society for Inventory Research, Budapest).

Other participants: Dr. Marco Schutten, Dr. Martijn Mes, Dr. Peter Schuur, one postdoc researcher (vacancy).

2.2.3 Technical University Denmark (DTU)

The Technical University of Denmark (DTU) is one of Europe's leading technical universities. The Department of Transport at DTU is one of the largest transport planning research units in Europe with focus on transport and logistics optimization, transport modeling, safety aspects of transport, transport economics, transport behavior and socioeconomic impact assessments. The department works closely with other transport research institutions nationally and internationally. One of the department's objectives is to co-operate with the national authorities, different interest groups and private companies on various aspects related to the research topics at the department. This gives the department a strong relation to the applications of the research undertaken and gives the research a valuable operational angle. The department has been and is currently involved in several FP7 projects within e.g. modeling and impact assessment.

Main tasks you have been attributed in the project
DTU will contribute to Work Packages 4, 5, 6 and 7 at different levels of involvement.

Relevant Experience
The Department of Transport at DTU has an extensive experience in working with large-scale research projects within transport and logistics optimization. The research section "Transport optimisation and transport engineering" (TOT) has for more than two decades been among the leading research communities studying the vehicle routing problem. Furthermore, the TOT section is also involved in research in for instance optimization of intermodal transport systems, transportation network design and intelligent road pricing systems.

Profile of staff members
Associate Professor Allan Larsen has worked within transport and logistics optimization for 15 years. His research interest lies within applying operational research based techniques to real-time transport and logistics planning problems. Allan Larsen has published several papers and book chapters within dynamic/real-time vehicle routing and airline disruption management. Allan Larsen is currently leading a research and development project dealing with real-time vehicle routing financed by the Danish Research Council's Innovation Consortium programme. Furthermore, Allan Larsen is heading the Department of Transport's section for Transport Optimisation and Transport Engineering.

2.2.4 Middle East Technical University (METU)

The Department of Industrial Engineering (IE) at Middle East Technical University (METU), the first of its kind in Turkey since 1969, currently employs a full time teaching faculty of 20. There are about 500 Bachelor's and 150 graduate students enrolled in the regular programs. Over 3000 Bachelor's degree have been awarded till today and approximately 300 Master's and 20 Ph.D. researches were completed. An MS program in Engineering Management is also offered to graduates of other departments and has an additional 150 students. In addition to their academic research, the IE faculty has also been active in joint research projects conducted for the industry and the government. Faculty have worked on various areas such as optimization, operations/logistics planning methods, supply chain management, mathematical modeling, stochastic modeling, simulation modeling, analysis of complex decision making, operations research, and data mining. Faculty are also involved in a number of research or industrial projects such as Multiple Criteria Evaluation in Sorting and Classification Problems, a joint research sponsored by the Scientific and Research Council of Turkey (TÜBİTAK) and CNRS (France), Pre-Positioning of Emergency Items Worldwide for CARE International, NJ Turnpike Long Term Incident Management Policy Planning under Probabilistic Environment, a joint research with Rutgers Intelligent Transportation Center and Application and Comparative Development of Data Mining Methods in Quality Improvement, sponsored by TÜBİTAK. They have published scientific papers in top-ranked international journals.

Main tasks within the project

Middle East Technical University will contribute to the Work Package 2, 3, 5, 6, and 7 at varying levels of involvement.

Profile of staff members

Dr. **Haldun Sural** is a faculty member at the Industrial Engineering Department, Middle East Technical University (METU), Ankara. He received his BS, MS, and PhD all from IE Department in METU. His work experience includes teaching and research positions at METU, Technology Management in INSEAD, Fontainebleau, France, Management Sciences in University of Waterloo, Ontario, Canada, and Wilfrid Laurier University, Ontario, Canada. His applied research works range from beer forecasting, logistics, and supply network design to restructuring a large humanitarian aid organization and waste management system design of metropolitan cities. He has publications on supply and distribution network design, lot sizing, inventory/production-routing, and vehicle routing. He is a member of the advisory board of OR Spectrum and he served at the editorial board of EMD (Journal of Industrial Engineering). He is past president of the OR Society of Turkey. His research interests include methodology, modeling, and applications in OR and history of OR in Turkey.

Dr. **Cem Iyigun** is an assistant professor at Middle East Technical University (METU) in Department of Industrial Engineering. Before joining to METU in 2009, he worked as a faculty at Rutgers Business School in Management Science and Information Systems (MSIS) Department and also at Rutgers Supply Chain Management as a researcher. He received his Ph.D. in Operations Research from the Rutgers Center for Operations Research (RUTCOR) at Rutgers University in 2007. His current research interests are related to Operations Research, Data Mining / Data Clustering Algorithms, Operations Management with special emphasis on clustering, data approximation, and facility location problems. He is also interested in stochastic programming methods with focus of emergency vehicle dispatching & incident management problems. He taught several MBA and undergraduate courses in Rutgers Business School and has been teaching in METU since 2009. Cem Iyigun received DIMACS Research Grant from the Center for Discrete Mathematics & Theoretical Computer Science in 2002, 2003 and 2007.

Dr. Sinan Gurel is an assistant professor in the Industrial Engineering Department of Middle East Technical University. He received his BS, MS and PhD degrees from Bilkent University. He worked as a visiting researcher at University of California Berkeley and as a postdoctoral researcher at Warwick Business School. He has taught courses on nonlinear optimization, discrete optimization at Middle East Technical University and his research interests include network design, airline disruption management and scheduling.

2.2.5 Vieanna University of Economics and Business (WU)

WU (Vienna University of Economics and Business) established in 1898 is the largest university of economics and business in the European Union with 433 faculty members (including 82 full professors) and more than 25.000 students. 26% are international students from 106 nations.
WU has been awarded the EQUIS accreditation in 2010, representing a clear recognition of WU excellent reputation, both at home and abroad.
The generation of knowledge and the active participation in the discourse of the scientific community are the main characteristics of research, which is one of the most important factors contributing to WU's international reputation. Research is a central component of WU's identity and an indispensable element in research-supported teaching.

Main tasks within the project

The members of WU will participate in WP 2, 3 ,4, 6 and 7.

Profile of staff members

Dr. Vera Hemmelmayr is an assistant professor at the institute of transport and logistics management at the Vienna University of Economics and Business. She received her PhD from the University of Vienna in 2008. Before joining WU in 2011, she worked at the University of Vienna and at the CIRRELT (Montreal) as a post-doctoral fellow. She was a visiting researcher at Georgia Institute of Technology and the University of Bologna. Her research interests include operations research, vehicle routing and city logistics. She has published several papers in journals such as Computers and Operations Research, European Journal of Operational Research, OR Spectrum, Discrete Applied Mathematics and Journal of Heuristics.

Dr. Pamela Nolz is assistant professor at the Institute of Production and Operations Management at the Vienna University of Economics and Business. She received her PhD in International Business Administration from the University of Vienna. During her PhD studies she was guest researcher at the École Centrale de Lille (2009). Before joining the Vienna University of Economics and Business she worked as a post-doctoral researcher at the École des Mines de Saint-Étienne (2010/11). Her research interests are focused on operations research in sustainable supply chain management (under uncertainty) and humanitarian logistics. Her research was published in journals such as *OR Spectrum, International Journal of Physical Distribution and Logistics Management* and *Flexible Services and Manufacturing Journal.*

Dr. Tina Wakolbinger is Professor of Supply Chain Services and Networks and Head of the Research Institute for Supply Chain Management at WU (Vienna University of Economics and Business, Austria). She received her PhD from the University of Massachusetts Amherst, USA. Prior to joining WU, she was an Assistant Professor at Fogelman College of Business and Economics, University of Memphis, USA. Tina Wakolbinger's research focuses on topics related to green and humanitarian logistics. Methodological tools that she uses include variational inequalities, game-theory, optimization and agent-based simulation. Her research was published in journals such as *European Journal of Operational Research*, *International Journal of Production Economics*, *International Journal of Production Research, Annals of Operations Research* and *Naval Research Logistics*.

2.2.6 Procter and Gamble

P&G is the brand-building leader of our industry. We've built the strongest portfolio of brands in the industry with 50 leadership brands that are among some of the world's best-known household names–and which together make up 90% of P&G's sales and more than 90% of profits. Twenty-three of these brands each generate more than $1 billion dollars in annual sales. No company in the world has invested more in consumer and market research than P&G. We interact with more than five million consumers each year in nearly 60 countries around the world. We conduct over 15,000 research studies every year. We invest more than $350 million a year in consumer understanding. This results in insights that tell us where the innovation opportunities are and how to serve and communicate with consumers.

Main tasks within the project

Procter and Gamble will participate in work package 6 and participate in the Advisory Board.

Participants: Sergio Barbarino

2.2.7 DHL

DHL comprises four divisions. These segments operate under the control of their own divisional headquarters. The Group management functions are performed by the Corporate Center. We have centralized the internal services which support the entire Group, including Finance Operations, IT and Procurement. This consolidation enables us to increase the flexibility of our business, improve service quality and leverage economies of scale and cost benefits. DHL's focus on selected industry sectors means customers benefit from working with specialists - not just in logistics, but also in their particular marketplace. With our industry-leading sector solutions, we provide our customers with real competitive advantage.

Main tasks within the project

DHL will participate in work package 6 and participate in the Advisory Board.

Participants: Sander van den Berg

2.2.8 EYEFREIGHT

EYEFREIGHT develops (software) products and services in carefully selected market niches, based on craftsmanship and in-depth functional knowledge of the niche in question. Each and every activity is preceded by a thorough preparation. Once we have chosen, we go for it full-heartedly, including the deployment of top-notch professionals and the full focused dedication of a team. The product should cause change in the market or in the field of expertise, the experience of use should be excellent, and our solution should be more efficient than the existing solution. The Itude Eyefreight product allows organizations to easily plan and monitor their logistics flows and process its administration automatically. One of the positive effects is that a company-wide overview of the transportation flows is created. This overview is a further basis for continuing optimization. EYEFREIGHT wants to be ahead in providing algorithms that will make Eyefreight suitable for converting intended optimizations to tangible results in daily practice. EYEFREIGHT is one of the selected expanding enterprises that shall start with the Growth Accelerator program. The program is an initiative of the Dutch Ministry of Economic Affairs and has officially been started by the Minister of Economic Affairs, Maria van der Hoeven. The Growth Accelerator Program helps ambitious entrepreneurs with a current turnover of a couple of millions to grow their business to over €20 million within 5 years. The program starts with two groups, each consisting of over 20 ‘growth entrepreneurs’.

Main tasks within the project

EYEFREIGHT will lead Work Package 6 in the development of the simulation environment via its EYEFREIGHT tool and participate in the Advisory Board.

Participants: Wouter Lammerse

2.2.9 DINALOG

The Dutch Top Technology Institute Dinalog (Dutch Institute for Advanced Logistics) is a scientific institute with high-quality applied research on cross chain control centres (4C), main ports control function and service logistics.
Dinalog was appointed on behalf of all the Triple Helix Partners in the Netherlands in Logistics and Supply Chain Management as the responsible organization for executing the National Innovation Program on Logistics and Supply Chain Management. Dinalog strives for open innovation that stands right to wide implementation by exploiting SME networks and by anchoring knowledge in curricula of training by three working parties: Academic, Professional and Vocational.
Dinalog is also responsible to develop and exploit the National Open Innovation Campus and Innovation Eco System in the Netherlands on Logistics and Supply Chain Management, located in the Rijn Schelde Delta region in Breda.

Main tasks within the project

Dinalog will lead Work Package 7.

Participants: Paul Huijbregts

2.2.10 Heineken

Heineken is one of the world's great brewers operating 140 breweries in more than 70 countries. The company is committed to the responsible marketing and consumption of its more than 200 international premium, regional, local and specialty beers and ciders. The continued success of Heineken across the world is fundamentally linked to our ability to successfully deliver our sustainability agenda.

Main tasks within the project

Heineken will participate in work package 6 and participate in the Advisory Board.

Participants: Laurens van de Rotte

2.2.11 BINNENSTADSERVICE (BIN)

The distribution in citycenters in the Netherlands has been a much discussed subject for years, both in the transport industry aswell the cities themselves. Everyone sees the problems with the current situation: The limited accessibility, the increased vehicle movement, the insecurity, bad air quality and the unwanted side effect of time windows. There have been many solutions, but many of them without long-term success. Binnenstadservice seeks to, from a new self-made perspective, offer a solution to this problem.

Main tasks within the project

BIN will participate in Work Packages 6 and 7.

Participants: Birgit Hendriks

2.3 Consortium as a whole

The CONCOORD consortium is multi-disciplinary and multi-national. It is organized to provide all the complementary capabilities that are necessary to satisfy the project objectives. Each of the aforementioned partners is specialized in different key project areas. The CONCOORD consortium consists of 5 universities and R&D institutes and 5 industry partners. CONCOORD is carried out by a consortium coming from 4 countries, i.e. The Netherlands, Denmark, Turkey and Austria. Each participant will contribute with its specific expertise.

The Dutch Top Technology Institute Dinalog (Dutch Institute for Advanced Logistics) is an important partner in the consortium. Dinalog was appointed in the Netherlands as the responsible organization for executing the National Innovation Program on Logistics and Supply Chain Management. Dinalog is also responsible to develop and exploit the National Open Innovation Campus and Innovation Eco System in the Netherlands on Logistics and Supply Chain Management, located in the Rijn Schelde Delta region in Breda. Moreover, DINALOG directly links to the other European logistics hubs, i.e. MIT-ZLC in Spain, to HOLM in Germany and to NGIL in Sweden.

The composition ensures a good balance between science, technological knowledge and users.

- Scientific partners: Well established in the logistics and operations research area with experience in (partly coordinating) roles in EU FP4/FP5/FP6 projects which will further contribute to the effective management and fulfillment of the project. Good complementarities combining experience in supply chain modeling cost/benefit considerations, closed loop supply chains and inventory planning.
- Knowledge transfer partner (Dinalog): Dinalog will facilitate substantially in the dissemination of the results by using the Logistics Experience Lab. This will be a 5000m^2 physical meeting place in Breda to experience the future in logistics via real-life demonstrations, games, movies, etc.
- Technology partner (ITUDE-EYEFREIGHT) is experienced on all technological levels: software development, system integration, communication, etc.
- All end users are represented both through participation in the Advisory Board (e.g. Transport for London, city of Eindhoven, etc.) and through the active partnership participation of DHL, P&G and Heineken.

2.4 Resources to be committed

Table 2.4: Overview of total costs

Applicant/ Partner	Overall Personnel Costs	Overall Travel Costs	Overall Material Costs	Consum-ables	Sub-contracts	Overhead costs	Total Costs	Requested Funding
TU/e	420.000,00	10.000,00	10.000,00	2.500,00		250.000,00	692.500,00	346.250,00
TU	370.000,00	10.000,00	10.000,00	2.500,00		250.000,00	642.500,00	321.250,00
DTU	230.000,00	10.000,00	10.000,00				250.000,00	250.000,00
METU	112.207,00	16.883,00	11.688,00	1.299,00	12.987,00		155.064,00	155.064,00
WU	203.616,00	2.100,00					205.716,00	205.716,00
PG	40.000,00	2.500,00					42.500,00	0,00
DHL	20.000,00	2.500,00					22.500,00	0,00
ITU	150.000,00	5.000,00	20.000,00				175.000,00	87.500,00
DIN	50.000,00	2.500,00					52.500,00	0,00
HEI	20.000,00	2.500,00					22.500,00	0,00
BIN	20.000,00	2.500,00					22.500,00	0,00
Total							2.283.280,00	1.365.780,00

The overall budget of CONCOORD reaches a total of €2.283.280 with a requested EC contribution of €1,365,780. This collaborative project takes 36 months, where the following activities will take place: research and technological development, management, demonstration and dissemination.

Personnel costs

Personnel costs correspond to the salaries paid for the employees in each of the participating organizations and companies. Overhead costs vary in different organizations and depend on the cost structure of each partner. They have been calculated in accordance with the Guide to Financial Issues. Table 2 shows the necessary effort allocated to the project at an activity level in terms of person months.

Travelling costs and other costs

Travelling costs are inevitable for all participants. An average cost for one person participating at a project meeting or workshop (which may last 1 ½ to 2 days) is estimated at € 750 per trip. EPMB meetings will rotate at countries represented within the consortium.

The following considerations have been taken into account in estimating the travelling costs for this project:

- The project will have duration of 3 years. Periodic EPMB meetings will be held twice a year; hence including the project's kick-off meeting and the final review meeting, there will be a total of around 7 project-wide EPMB meetings to be attended by all the project partners. In addition, it is expected that each project partner will attend a total of 6 technical meetings, to work with his other WP parties. This cost is allocated to research and innovation related activities.
- The Project coordinator, TU/e, who will undertake the administrative management, is expected to have a total of 3 meetings with the Commission in Brussels. This cost is allocated to management activities
- TU/e is expected to have two representatives at EPMB meetings and meetings with the Commission, whereas all other contractors one representative.
- Travel costs for the dissemination activities are also foreseen. Per partner in the consortium, travel costs are expected for participation in (industrial and academic) conferences, seminars, etc.
- Additional travel costs are reserved for the meetings of the Advisory Board. Six meetings during the project lifetime with 5-10 participants and average trips cost of €750 for travel, room rent and catering costs per participant amount to a total of €50,000.

URBAN EUROPE
Joint Programming Initiative

During the development of the CONCOORD project, the procurement of hardware, software and dissemination material is necessary. The following budgets have been considered:

- €30,000 to EYEFREIGHT for setting up the clouds and 3rd party software (GUROBI, databases, etc)
- €15,000 to University of Technology Eindhoven for website development and marketing material
- €14,000 to University of Technology Eindhoven for the FP7 project management environment EU-Xpert
- €10,000 to traffic modeling data to be used in Workpackage 2, 3, 4, 5 and 6. The money requested is an estimate of the costs for purchasing a current digital street-level vector network of a city such as London including speeds (by road and time of day), driving restrictions (e.g. one-way streets, access restrictions etc.) and contours. As well as accurate information on the road network and its connections, information on the speed of the traffic at different times of day and the inclines of the roads will be needed to evaluate the costs and times required for different routes and schedules.
- An allocation has been made by CONCOORD partners, as other project specific costs, to allow obtaining the audit certificates required by the EC for participation in FP7 projects.

2.5 Requested funding per partner

Partner NR	Total eligible costs according to national rules (in €)	National Contribution requested (in €)
TU/e	692.500	346.250
TU	642.500	321.250
DTU	250.000	250.000
METU	155.064	155.064
WU	205.716	205.716
PG	42.500	0
DHL	22.500	0
ITU	175.000	87.500
DIN	52.500	0
HEI	22.500	0
BIN	22.500	0
TOTAL	**2.283.280**	**1.365.780**

3. Relevance to Urban Europe call text 2012

3.1 Fit to objectives, key areas and priorities of the call text

This proposal directly links to the JPI Urban Europe Topic 2: Urban systems and networks. Specifically, we deal with the consolidation in and coordination of multiple interrelated systems and networks in order to obtain higher efficiencies, lower external effects and/or higher reliability.

This proposal also is strongly linked with two other Dinalog Research and Development projects: 4C4D and Freight Hitchhiking. However, the CONCOORD goals are clearly distinct from these two other projects. CONCOORD aims at developing a a complete European Urban Transportation Experience Lab, in which outcomes and results of these different projects can be integrated. Next to this, uncovered research questions will also be handled in CONCOORD (think of gain sharing, and the close involvement of governments).

3.2 Added value of European trans-national co-operation

There is a clear added value to perform this project on a European level. The scattered results of national and regional efforts will be put into a European scope. Consensus building will be performed on a European scope as well in order to obtain a broad acceptability of the proposed approach and methodologies. We will offer solutions which are independent of existing national and urban regulations. Logistics and supply chain management by definition require a transnational approach for several reasons:

- The analysis and integration of the current research agenda, stakeholder needs and complementarities between partners would have little effect if it were done at a national level. The results of the analyses will have a European dimension so that the output can also be used by other European countries.
- Operations in a particular region may have an impact on the global logistics and supply chains.
- Also, sustainability of transportation and supply chain management as an important European challenge needs to be developed on the basis of standard characteristics and tools that can be interpreted and used in any European region or country.
- Other elements include joint efforts such as staff exchanges, research plans, training and innovation activities. Existing collaborations and exchanges within clusters will be further developed and enhanced, but more importantly; new training and exchange plans will be set between clusters so that partners can teach and learn from each other how to strengthen their own cluster, based on best practices from other clusters. All partners and specifically the mentoring region will benefit from such a transnational approach.
- A strong global competitiveness of Europe can only be achieved by promoting and aligning (regional) innovation policies, and providing a platform for regions to collaborate and exchange experiences.

3.3 Scientific relevance

There is a clear gap in the scientific literature and the real practices operated in urban freight transportation planning. As the number of related industry-based projects and initiatives is increasing, there is a necessity to carry out sound scientific research in this area which addresses the actual base problem faced by those involved in these activities. This necessity stems from the fact that scientific research can easily be disseminated between interested parties. Furthermore, extensive research, as proposed in this project, results in a realistic modeling framework. The advantages of having an elaborate modeling framework are as follows:

- It enables a generalized treatment of an urban environment. Thus, nearly any urban environment can be modeled, i.e., not limited to the needs of a specific city.
- The solutions to the models provide quantitative indications for the different measures.

- Local authorities can assess alternative transport policies. These are to be embedded as constraints to the planning tools in the cases of rigid regulations, or as cost reductions in the cases of financial incentives.
- Private companies can evaluate the various coordination and consolidation schemes.

A major advancement of the proposed project lies in the identification of the true problems, the sound modeling of these problems and the development of advanced solution methodologies to deal with the models in a real-life setting. The underlying problems treated in the proposed project are computationally involved. The quality of the solutions, for the proposed project, is highly critical. Thus, a great deal of in investment is required for developing efficient solution procedures.

4. Potential impact of the project

4.1 Expected impacts

Contribution to European policy objectives
The EU Commission has adopted an important new strategy with the aim to achieve a more efficient and sustainable freight transport: co-modality and logistics. Key to a successful achievement of this policy is the use of information and communication systems and intelligent transport systems in the supply chain should be encouraged as a matter of priority.

This project fits into the policy of the European Commission and is directly relevant for the implementation of the EU policies in the following way. The White Paper "European transport policy for 2010: time to decide" (20) clearly states that the development of combined transport should be actively promoted. A principle motivation behind this reasoning is to significantly break the link between economic and transport growth, without restricting mobility, by making more efficient use of means of transport. Within the White Paper main issues related to sustainable surface transport are:

- Shifting the balance between modes of transport, in particular for freight transport
- Share per transport mode in 2010 should be equal to the share in 1998
- Eliminating bottlenecks in European transport networks
- Developing motorways of the sea
- Offering innovative services
- Towards multimodal corridors giving priority to freight.

The recent update of the White Paper further stresses the need to act, as the implementation is lagging behind to reach objectives. While in the initial White Paper attention for greenhouse gas emissions was limited, it is quite clear that any specific attention for carbon emissions in transport may accelerate the speed towards reaching other policy objectives such as congestion and efficient usage of public infrastructure.

The strategic impact of the current project is evident. We develop and demonstrate how supply chains can be made more sustainable and less damaging to the environment. This proposal would specifically provide a measurement framework that is validated with actual data at the supply chain level. Detailed quantitative models and analyses would provide the underpinnings for any forthcoming legislation and directives. At the same time, with thorough benchmarking and impact analysis as well as input from industry partners, the deliverables from this proposal would ensure that European industry stays competitive. Further, the tools, methods and data measurement techniques developed in the course of this project will be implementable and help optimize supply chain strategies for both economic and social benefit.

Contribution to the reduction of CO_2 emissions from surface transport

We need to better understand and cope with issues such as climate change and identify environmentally friendly technologies and procedures in order to improve our management of both natural and man-made resources. The activities will address policy needs such as the sustainability impact assessments of EU policies and the follow up to the Kyoto and post-Kyoto actions on climate change. Climate change is now the priority environmental problem with the most significant EU measures having recently been proposed by the Commission and waiting agreement between the Council and European Parliament. These include measures to limit CO_2 emissions from new cars, to include aviation in the EU Emissions Trading System (ETS), to apply differentiated annual circulation and registration taxes for cars based on their CO_2 emissions and to ensure that all means of transport not covered by the ETS contribute to achieving national targets for limiting greenhouse gas emissions.

Surface transport imposes costs on society due to the impacts it causes. Transport emissions threaten our health, negatively affect our local environmental quality and make a significant and growing contribution to climate change. CO_2 emissions from the road sector are 30% higher than in 1990 and transport is the only sector of the economy where emissions are predicted to increase in the future. Exhaust fumes, traffic noise and road congestion are an everyday annoyance for many citizens, and transport accidents kill many people each year.

As far as tackling pollution is concerned the EU has already achieved a great deal, but there remains a significant amount of work still to be done. Measures to limit air pollution have been developed in the framework of the Single Market and vary considerably between the means of transport but are focused on limiting emissions from new vehicles (the "EURO" standards), vessels or recreational craft. There are also maximum levels of certain pollutants in fuels, such as sulphur in marine fuel and lead in petrol, and rules to reduce emissions during fuel storage and distribution. For waterborne transport there are requirements to limit water pollution. All transport modes are covered by general legislation on where and how waste can be disposed of and there are specific requirements for some types of road vehicles and their components (e.g. tyres, batteries). The diesel tax aims at reducing the amount of diesel consumed by increasing the price of diesel. It is likely that the EU will oblige countries to raise the excise tax on diesel equal to or higher than the excise tax on petrol. The Euro-Vignette has already been implemented; however the current vignette does not yet take into account costs regarding CO_2 emissions. Several proposals have been done to implement an additional cost, which takes into account the emissions of the vehicle, i.e. to apply "the polluter pays" principle.

Our approach distinguishes itself from other approaches by taking a supply chain perspective and thus directly informing the owners and designers of those supply chains over and above the logistics service providers. A policy directed at the design and operation of the supply chain is likely to yield substantial more impact.

Competitiveness

Mobility is essential to our quality of life and is vital for the EU's competitiveness. It is the backbone of the economy making the links between the different stages of production chains and allowing service industries to reach their clients, as well as being a significant employer in its own right. As such it is important to achieving the goals of the EU's 'Lisbon' strategy for growth and employment. This is all the more so given that the sector is growing rapidly: between 1995 and 2005, goods and passenger transport in the EU grew by 31.3% and 17.7% respectively and this growth is predicted to continue.

EU measures have helped finance increased and alternative infrastructure capacity and EU policy has aimed to move transport away from the most congested modes, while at the same time developing common charging frameworks. There are existing measures for charging heavy-goods vehicles for infrastructure use and also specific requirements for rail infrastructure. In addition, the Commission recently made a proposal on airport charging. Rail, inland waterways and maritime transport receive most funding for infrastructure provision under the Trans-European Networks and the Marco Polo programme, mainly in order to encourage a shift from road transport. There are measures in the air and rail sectors that aim to increase infrastructure efficiency, and work on technological improvements in the road sector is ongoing.

"*Getting the prices right*" is essential. Transport users already pay a significant amount, but the price they pay often bears little connection to the real costs on society of their choices. They have thus no incentive to adopt less costly behaviour. By making payments smarter, economic instruments (taxes, charges or emission trading schemes) can encourage transport users to switch to cleaner vehicles or modes (including walking and cycling), to use less congested infrastructure or to travel at different times. As such they represent an effective way to make mobility sustainable.

4.2 Dissemination and/or exploitation of project results, and management of intellectual property

4.2.1 Exploitation and dissemination plan

Communication and results dissemination are essential for a successful achievement of the CONCOORD objectives, to protect the participants' interest and exploitation perspectives in view of achieving overall acceptance and implementation of the project's results. The expected outcomes of CONCOORD are expected to have long-term effects for all actors on the actual decision making in urban freight transportation.

The communication and dissemination activities aim at generating an effective flow of information and publicity regarding the targeted objectives, the results obtained during the CONCOORD project, the contributions made to

European knowledge on urban transport and scientific excellence, as well as the value of collaboration on a European-wide scale and the benefits to EU citizens in general. As such, this collaborative project does not generate a single result but a broad range of results expected to be exploited by different means and actors. Passive communication channels are the website, folders, contributions in professional journals, etc. Active communication channels are presenting seminars, executive courses, and the EU/t E-Lab.

In the CONCOORD project, the leader of the Dissemination activities will be Dinalog, which has extended experience for this type of activities. Dinalog strives for open innovation that stands right to wide implementation by exploiting industrial networks and by anchoring knowledge in curricula of training by three working parties: Academic, Professional and Vocational. Through the many links with other European clusters (i.e. MIT-ZLC, NGIL, and HOLM), a wide range of dissemination channels in Europe is available. These contacts will form the basis for a widespread dissemination of project results, excellence and knowledge, not only in Europe but also beyond. A key dissemination instrument will be the set up of the **EU/t E-Lab** (the European Urban transportation Experience Lab), within the Logistics Experience Lab to come in Breda (NL).

Additional dissemination activities include:

1. Seminars and conferences
2. Executive courses, regional, national and international master classes
3. Knowledge Portal
4. Electronic platforms

A final event will be organized, bringing together stakeholders, experts, academics, etc. in the urban transportation area, and educating this audience about the experiences of CONCOORD and sharing the lessons learnt.

4.2.2 Management of intellectual property rights (IPR)

The leading principle concerning IPR will be that all partners will retain IPR over their own work and innovations before joining the consortium and a formal Consortium Agreement covering general collaborative arrangements and all participants will sign ownership of results. The IPR rights of the systems to be developed will stay in Europe.

This part of the Consortium Agreement will describe

- Procedures for the ongoing identification, tracking and registration of knowledge as it is produced
- Measures for the adequate and effective protection for knowledge that is capable of industrial or commercial application
- Procedures for publications of knowledge produced by the project to ensure that it will not affect the protection of that knowledge

In addition, local interim licensing agreements will be put in place between partners should the need arise to exchange software. These licensing agreements will cover the exchange of specific versions of developed software at zero license fees, the use of databases as compiled by individual participants, and access to all data for the purpose of validation. The aim will be to ensure no impediment exists to the development and validation of the methodologies and software.

5. Interdisciplinary and cross sectorial collaboration

5.1 Interdisciplinary collaboration

To ensure a high value of the interdisciplinary colloboration our work is led by an expert people who coordinate the work of the project team at all work packages and ensure a smooth process as well as sufficient interdisciplinary and interaction. The CONCOORD consortium consists of 5 universities from 4 different universties.

Wintin in TU/e, the unit Urban Science and Systems (USS) deals with teaching and research in the field of planning, development and management of cities and large-scale urban artifacts, for example shopping malls, urban green spaces and offices. The unit has four chairs: Construction management, Urban planning, Design systems and Real estate management. Harry Timmermans heads this group.

The strategic impact of the current project is evident. We develop and demonstrate how supply chains can be made more sustainable and less damaging to the environment. This proposal would specifically provide a measurement framework that is validated with actual data at the supply chain level. Detailed quantitative models and analyses would provide the underpinnings for any forthcoming legislation and directives. At the same time, with thorough benchmarking and impact analysis as well as input from industry partners, the deliverables from this proposal would ensure that European industry stays competitive. Further, the tools, methods and data measurement techniques developed in the course of this project will be implementable and help optimize supply chain strategies for both economic and social benefit.

The advantages of the proposed project in terms of solution methodologies are as follows:

- All solution procedures will draw upon existing research, and will be expanded to fit urban freight transport.
- A distinct solution procedure will be developed separately for each of the components of the overall problem. This will enable validation of the procedure on benchmark instances.
- The set of solution procedures is to be integrated into an encompassing optimization procedure, fitting the different layers of decision making in the urban freight transport environment, i.e., strategic tactical and operational.
- Solution methodologies will be accessible to the public, through various channels, so they may be adopted and adapted to match future needs.

5.2 Cross sectorial collaboration

The CONCOORD consortium is multi-disciplinary and multi-national. It is organized to provide all the complementary capabilities that are necessary to satisfy the project objectives. Each of the aforementioned partners is specialized in different key project areas. The CONCOORD consortium consists of 5 universities and R&D institutes and a number of industry partners. A consortium coming from 4 countries, i.e. The Netherlands, Denmark, Turkey and Austria carries out CONCOORD. Each participant will contribute with its specific expertise. Within the Netherlands, the Eindhoven University of Technology (prof.dr. Tom Van Woensel) will be the project leader. The University of Twente (prof.dr. Henk Zijm) is a partner in the consortium, next to METU (Turkey), Vienna University of Economics and Business (Austria) and the Technical University of Denmark.

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6. Signature

Administrative Authorisation

This is to confirm that the participant named below is a recognised body to make applications to one of the funding agencies engaged in the Joint Programming Initiative Urban Europe and that the application has been approved for submission by the due authorities in the institution. If awarded, the institution agrees that it will abide by the standard and any special funding conditions set by the funding Partners in the administration of the award. I also confirm that I have the due delegated authority to sign such applications on behalf of the institution.

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